VIZ Electronic Instruments

Digital Power Line Monitor
WD 121

- High accuracy, easy-to-read .8 inch LED display
- Reveals bounces and fluctuations in line voltages. Indication of 'brown-outs'.
- Can be installed between AC line and unit to be monitored
- Three-wire power cord
- Fused
- Thru Line: 100-150 VAC with line input, 8A max.
- Auxiliary: 0-500 VAC with exteneral input

VIZ **Mfg. Co.** 335 E. Price Street, Philadelphia, PA 19144

Price
.75

SPECIFICATIONS

"LINE" Position (Thru line)

Frequency Range	50-60 Hz
AC Voltage Range	100-150V Line
Accuracy	± 1%
AC	8 Amps Max

"EXT" Position (Auxiliary Input)

Frequency Range	50-60 Hz
AC Voltage Range	0-500V
Accuracy	± 2%
AC	Not applicable
Dimensions	4 × 5 × 3 in. (10 × 12.7 × 7.8 cm)
Weight	1½ lbs. (670 gms.)

General

The VIZ WD-121 Digital Power-Line Monitor is designed for use by industries, laboratories, research and development, and radio-TV repair shops where it is important to know the power-line voltage at all times. This instrument provides a continuous, accurate indication of the AC line voltage at a glance without the inconvenience of handling probes and switches or the necessity of selecting one of several scales to determine the proper meter reading.

Used in conjunction with the VIZ WP-26A, WP-27A or WP-28A Isotap isolation transformer on a 50-60 Hz power line, the WD-121 is a valuable aid in selecting line voltages for such applications as TV servicing, test instrument calibration, and the operation of electronic equipment that requires a known line voltage supply. A convenient power line socket is located on the side of the unit, so that meter can be placed between line and AC powered units.

The WD-121 can be used on 100 to 150V AC power line sources with a frequency of 50 Hz or 60 Hz with the switch in "LINE" position. The instrument features accuracy of ± 1%.

When the "LINE/EXT" switch is in "EXT" position, the WD-121 is capable of measuring voltages from 0 to 500 VAC using the test jacks located on the lower right hand side of the unit.

The resolution of the digital display enables the user to see even small changes in line voltage or fluctuations.

Operation

To use the WD-121, simply plug the line cord into the AC outlet. The digital display will indicate the voltage of the AC power line. The instrument may be left on permanently, providing a continuous indication of the power line voltage.

CAUTION: THE WD-121 SHOULD BE USED TO MONITOR POWER LINE VOLTAGES CONTINUOUSLY ONLY IN THE THRU LINE POSITION ("LINE" POSITION). VOLTAGES WHICH CAN BE MEASURED BY THE "EXT" POSITION, i.e. 440 VAC, CAN BE HIGHLY DANGEROUS IF MISUSED. WHEN USING THE AUXILIARY INPUT ("EXT" SWITCH POSITION), ALWAYS CONNECT THE TEST LEADS TO THE INPUT JACKS FIRST. ALWAYS USE A TEST PROBE, SUCH AS THE VIZ 9200-700 DELUXE TEST PROBE WHICH FEATURE HEAVY DUTY LEADS, PROBE, GROUND CLIP, AND DUAL BANANA JACKS FOR SAFETY.

The convenient power line socket located on the side of the WD-121 offers an extra AC power source at a known line voltage (same as digital display).

NOTE: THE EXTERNAL SOCKET IS LIMITED TO 150 VAC @8 AMPS MAXIMUM OUTPUT.

To use the WD-121 to check voltages from 0 to 500 VAC, simply plug the line cord into the AC outlet. With the "LINE/EXT" switch in "EXT" position, plug the test leads (like the VIZ 9190-700 Probe with dual banana plug) into the jacks located on the right hand-hand side of the WD-121 and measure the desired voltage as read on the LED displays.

Calibration

The WD-121 is carefully calibrated at the factory in comparison with dynamometer-type laboratory standard reference meters. If recalibration is required, the WD-121 should be sent to VIZ Mfg. Co. or the nearest authorized VIZ Test Equipment Repair Station. These stations are equipped with the necessary precision reference standards.

CAUTION: Calibration should only be done by fully qualified persons as dangerous voltage may be present. See CAUTION below. As a safety precaution, it is recommended that an isolation transformer such as the VIZ WP-26A, WP-27A or WP-28 Isotap be used during this calibration procedure.

1. Remove the two screws on the bottom and rear of the instrument and remove the nut holding the "LINE/EXT" Switch in position. Push the "LINE/EXT" Switch in and then lift off back cover from the case.

CAUTION: The back cover cannot be completely detached from the case. It is joined by two wires from the power transformer.

2. Connect the WD-121 together with a secondary standard reference meter with an accuracy of ± .25% to a variable power source.

3. With the line cord plugged in and the "LINE/EXT" switch in "EXT" position, adjust variable pot, R5, for zeros on all three displays.

4. Then switch to "LINE" position.

5. Set the voltage source at 120 volts indicated on the reference meter. Adjust the variable ohm resistor, R6, so that the WD-121 display reads 120 volts. Adjust the voltage source for 100 volts AC. The WD-121 display will read 100 volts ± 1% (99 to 101). Readjust the voltage source for 150 volts AC. The WD-121 display will read 150 volts ± 1% (148.5 to 151.5).

NOTE: The same voltages should be present at the line socket located on the side of the WD-121.

Troubleshooting

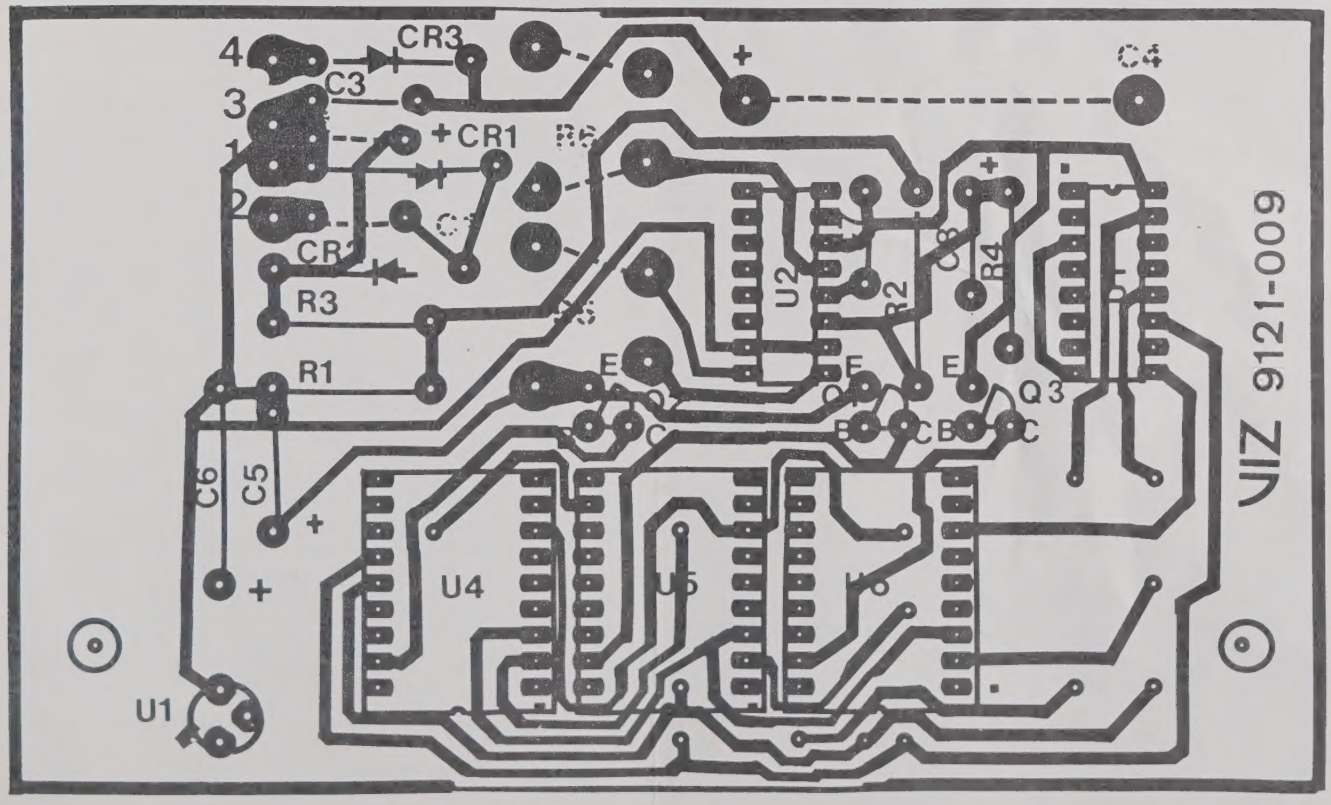
The troubleshooting problems concerning the WD-121 should be limited to Display Board, Fuse, Transformer, and the "LINE/EXT" Switch.

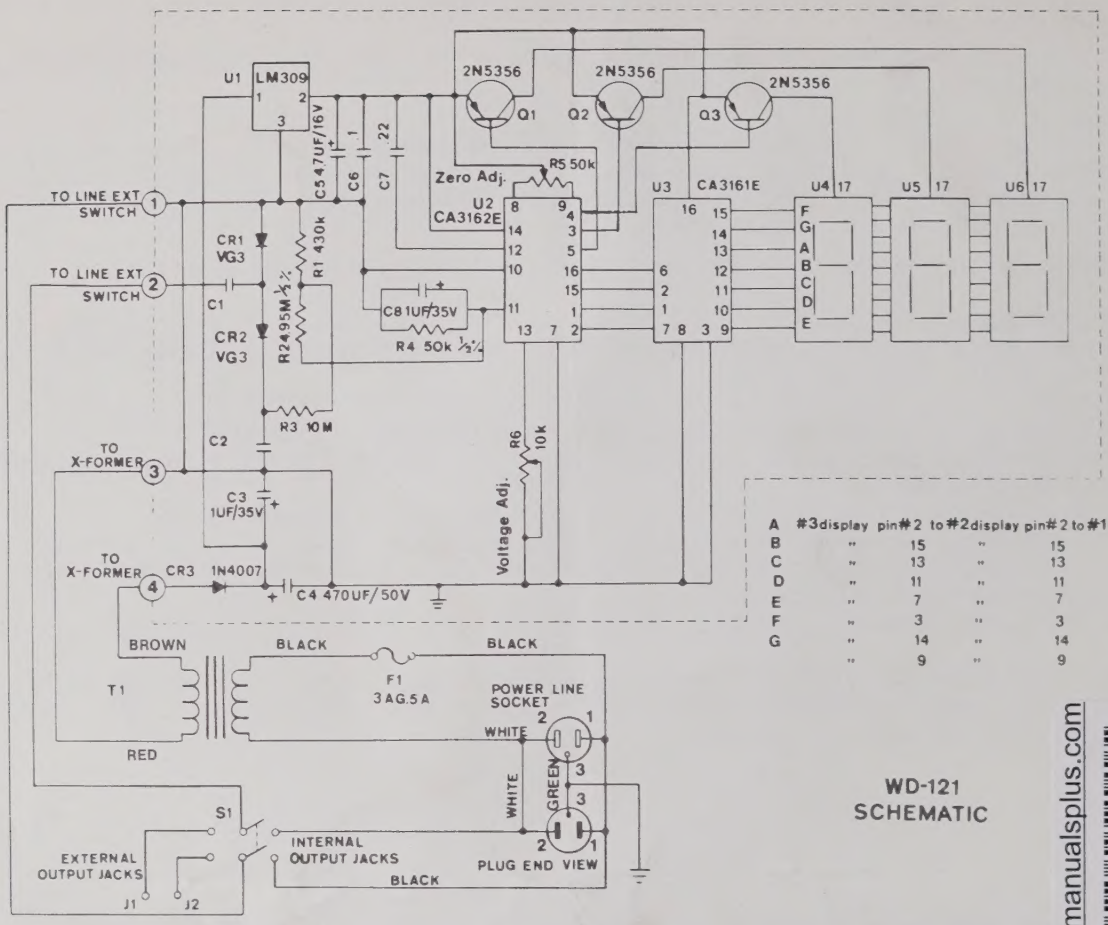
Display Board

1. **Blinking Display**. Check power supply + 5V. Check U2 (CA3162E) and U3 (CA3161E).
2. **Improper Readings**. Check power supply + 5V. Check regulator, U1 (LM309), for normal operation. Check voltages on U2 and U3.
3. **Won't Zero**. Check power supply + 5V. Check voltage on U2. Check U1 regulator (LM309).
4. **Missing segments on Displays**. Check each display that exhibits a bad segment by replacement. If this does not correct the problem, check the inputs to displays U4, 5, and 6 and the outputs from U2 and U3.

Additional Troubleshooting Information

1. **Instrument completely dead.** Check Fuse (F1). Investigate cause for blown fuse, correct, and replace if defective.
2. **Proper voltage at secondary of transformer but no lighting of displays.** Check rectifier diode (CR3).
3. **Proper voltage applied to the external jacks but erratic or no display reading**. Check CR1, CR2 (High Voltage Diodes). Check "LINE/EXT" Switch.





	#3 display pin#	2 to #2 display pin#	2 to #1 display pin#	2
A	"	15	" 15	" 15
B	"	13	" 13	" 13
C	"	11	" 11	" 11
D	"	7	" 7	" 7
E	"	3	" 3	" 3
F	"	14	" 14	" 14
G	"	9	" 9	" 9

WD-121 SCHEMATIC

www.manualsplus.com
1034766

REPLACEMENT PARTS LIST WD-121

SYMBOL NO.	DESCRIPTION	PART NO.
	CAPACITOR	
C1, C2	Cer. Disc. .023μF, 3kV, 20%	9180-049
C3	Tantalum, 1μF, 10%, 25V min.	1223-001
C4	Electrolytic, 470μF, 50V	9404-027
C5	Electrolytic, 4.7μF, 15V	9605-208
C6	Cer. Disc., .1μF, 12V	9605-216
C7	Metal film, .22μF, 10%	9605-312
C8	Tantalum, 1μF, 10%, 25V min.	1223-001
	RESISTOR	
R1	Precision 430K, 1%, ¼W	9121-118
R2	Precision 4.9M, 0.5%, ½W	9605-207
R3	Car. film 10M, 5%, ¼W	16-161061
R4	Precision 50K, 0.5%, ½W	16-900037
R5	Var. 50K	9121-115
R6	Var. 10K	9198-298
	DIODE	
CR1, 2	VG3 High Voltage	11-900000
CR3	1N4007 Silicon	11-040070
	TRANSISTORS	
Q1, 2, 3	2N5356	12-053560

SYMBOL NO.	DESCRIPTION	PART NO.
	INTEGRATED CIRCUITS	
U1	Regulator LM309	9605-215
U2	A/D Converter, CA3162E	9605-218
U3	Dec. Driv., CA3161E	9605-223
U4 thru U6	Display, Numeric 8610	9121-117
	MISCELLANEOUS	
T1	Transformer Power	9121-040
	Meter, back, plastic	9121-017
	Case Cover, perforated metal	9121-014
	Case, back, metal	9121-011
	Term Strip	9120-016
	Socket, outlet, 3 pin	9120-013
	Banana Jack Red	25-900003
	Cord power 3 cond., 6 ft.	9415-026
	Strain relief 9415-021 ~~9121-400~~	
	Meter Cover, plastic	9121-016
	Fuse, 3AG, .5 Amp	9121-148
	Fuse Holder	9327-053
	Filter, red	9121-022
	Panel, Dress, WD-121	9121-025
	Switch, DPDT	9605-015
	Pin for IC/LCD	9192-177

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